

PhD Position Safe Control of Uncertain Systems from Data

Challenge: Ensure the safety of the decisions of probabilistic systems using data

Change: Develop novel control theory and machine learning methods for uncertain dynamical systems

Impact: Produce new intelligent, possibly data-driven, methods for safe control of probabilistic and uncertain systems

Job description

TU Delft is a top tier university and is exceedingly active in the field of Artificial intelligence and Control Systems. Our long-term ambition is to lay a foundation for the development of future autonomous systems that can reliably and beneficially interact with humans.

On this PhD project you will investigate the combination of probabilistic methods and formal methods from computer science and control theory to devise solutions to problems in the context of uncertain control systems. In particular, the project will shift towards distributionally robust optimization and model predictive control for ensuring the correctness and performance of AI based control systems learnt from data.

You will work at the Delft Centre of Systems and Control (DCSC) and will be supervised by Luca Laurenti & Azita Dabiri.

The Delft Centre for Systems and Control (DCSC) coordinates the education and research activities in systems and control at Delft University of Technology. The Centre's research mission is to conduct fundamental research in systems dynamics and control, involving dynamic modelling, advanced control theory, optimisation and signal analysis. The research is motivated by advanced technology development in physical imaging systems, robotics and transportation systems. The group actively participates in the Dutch Institute of Systems and Control (DISC).

Job requirements

- An MSc degree in systems and control, applied mathematics, electrical engineering, computer science, or related fields.
- Basic knowledge of control theory and/or machine learning (waived if the candidate is particularly skilled on theoretical computer science, optimization, or stochastic processes).
- Strong analytical skills and an ability to work at the intersection of several research domains, in particular control theory and computer science.
- Basic programming skills are expected.
- Good command of the English language and good communication skills.

TU Delft (Delft University of Technology)

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context.

At TU Delft we embrace diversity as one of our core [values](#) and we actively [engage](#) to be a university where you feel at home and can flourish. We value different perspectives and qualities. We believe this makes our work more innovative, the TU Delft community more vibrant and the world more just. Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale. That is why we invite you to apply. Your application will receive fair consideration.

Challenge. Change. Impact!

Faculty Mechanical Engineering

From chip to ship. From machine to human being. From idea to solution. Driven by a deep-rooted desire to understand our environment and discover its underlying mechanisms, research and education at the ME faculty focusses on fundamental understanding, design, production including application and product improvement, materials, processes and (mechanical) systems.

ME is a dynamic and innovative faculty with high-tech lab facilities and international reach. It's a large faculty but also versatile, so we can often make unique connections by combining different disciplines. This is reflected in ME's outstanding, state-of-the-art education, which trains students to become responsible and socially engaged engineers and scientists. We translate our knowledge and insights into solutions to societal issues, contributing to a sustainable society and to the development of prosperity and well-being. That is what unites us in pioneering research, inspiring education and (inter)national cooperation.

Click [here](#) to go to the website of the Faculty of Mechanical Engineering. Do you want to experience working at our faculty? These [videos](#) will introduce you to some of our researchers and their work.

Conditions of employment

Doctoral candidates will be offered a 4-year period of employment in principle, but in the form of 2 employment contracts. An initial 1,5 year contract with an official go/no go progress assessment within 15 months. Followed by an additional contract for the remaining 2,5 years assuming everything goes well and performance requirements are met.

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2872 per month in the first year to € 3670 in the fourth year. As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring

research environment with an excellent team of supervisors, academic staff and a mentor. The Doctoral Education Programme is aimed at developing your transferable, discipline-related and research skills.

The TU Delft offers a customisable compensation package, discounts on health insurance, and a monthly work costs contribution. Flexible work schedules can be arranged.

For international applicants, TU Delft has the [Coming to Delft Service](#). This service provides information for new international employees to help you prepare the relocation and to settle in the Netherlands. The Coming to Delft Service offers a [Dual Career Programme](#) for partners and they organise events to expand your (social) network.

Additional information

If you would like more information about this vacancy or the selection procedure, please contact Luca Laurenti or Azita Dabiri, via l.laurenti@tudelft.nl or a.dabiri@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply no later than 15 Dec 2024 via [this application link](#) and upload the following pdf files:

- (pdf 1) 1-page Motivation letter, your CV;
- (pdf 2) a (part of your) M.Sc. thesis or a paper that you have written, in which you demonstrate your writing skills;
- (pdf 3) academic transcripts of both your BSc and MSc degrees.

Please highlight in your motivation letter and/or CV examples of projects and achievements that demonstrate your relevant competences

You can address your application to Luca Laurenti or Azita Dabiri.

Doing a PhD at TU Delft requires English proficiency at a certain level to ensure that the candidate is able to communicate and interact well, participate in English-taught Doctoral Education courses, and write scientific articles and a final thesis. For more details please check the [Graduate Schools Admission Requirements](#).

Please note:

- You can apply online. We will not process applications sent by email and/or post.
- A pre-employment screening can be part of the selection procedure.
- A knowledge security check will be part of the selection procedure (for details page 45: [national knowledge security guidelines](#)).
- Please do not contact us for unsolicited services.